COLORADO LAW

Wolf Law Building
Boulder, Colorado 80309
Samuelson-Glushko Technology Law & Policy Clinic

UNIVERSITY OF COLORADO LAW SCHOOL

April 7, 2011

Kendria Alt
Student Attorney
Samuelson-Glushko Technology Law & Policy Clinic
Kendria.Alt@Colorado.edu

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Submitted electronically via website

Re: *Ex Parte* Notice
Advanced Communication Provisions of the Twenty-First Century Communications and Video Accessibility Act of 2010
WC Docket No. 10-213

Dear Ms. Dortch,

I recently met with Elizabeth Lyle, Special Counsel for Innovation, Wireless Telecommunications Bureau, to discuss my law school clinic research project on the possible accessibility add-on and plug-in detection by employers and insurance companies.

During the meeting, we first discussed my research on the technology behind detecting a user's installed browser accessibility add-ons, plug-ins, extensions, and apps (collectively, I call these "browser enhancers"). I noted that:

- The current technology could enable employers and insurance companies to see a user's installed browser enhancers; detecting browser enhancers is a very simple thing to do.
    - Plug-ins and add-ons are pieces of software that enhance the capabilities of a larger software application, such as a web browser.
    - When a user visits a website, he allows that website to access a lot of information about his computer's configuration and the web browser that he is using. Such information includes the computer's screen size, operating system, software vender, software version, web browser, and installed browser enhancers.

    - This information allows the website to provide properly formatted content to the user's computer.
- People with disabilities often use browser enhancers to access information on the Internet.

Next we discussed my research related to possible discrimination, by employers and insurance companies, against people with disabilities based on the user's installed browser enhancers. I explained that:

- If the employer or insurance company requires the user to interact with it online, then the fear is that the company could see that the user (i.e. potential employee, current employee, potential insured person, current insured person) has an add-on installed that is specific to his disability and use this information against the user.
- An example would be a person with a vision impairment, who uses a screen reader add-on, applying for a job on the potential employer's website. The potential employer sees the installed add-on and decides not to hire the applicant because the employer does not want to pay for accessibility programs for the applicant, if hired.

We also discussed the positives of the detection technology:

- If the website knows the user's computer configuration and browser enhancers, then the website can send the user's computer properly formatted information.
- When the user visits a website, then that website's targeted ads may recommend improved screen readers or other products of interest to the user.
- Lastly, I explained the device fingerprint, which is based on the detection technology. Device fingerprints are a compilation of all of the information about a user's computer configuration. The device fingerprint was developed for fraud protection and is commonly used by banks for online banking.

I further expressed that the FCC should be aware of this potential discrimination against people with disabilities via the Internet. The FCC wants broad adoption of broadband; therefore, the FCC should address Internet privacy concerns to ensure that people are comfortable using the Internet and will use the broadband.

Sincerely,

/s/

Kendria Alt
Student Attorney
Samuelson-Glushko Technology Law and Policy Clinic
University of Colorado Law School

Attachments: Leave-Behind I gave Ms. Lyle at the outset of our meeting.

Accessibility Browser Enhancer Detection by Employers & Insurance Companies

Kendria Alt - University of Colorado Law Student Attorney
Monday, March 21, 2011

***Goal**:* Inform regulatory agencies and rule makers

- I suggest that the FCC examine whether a website owner could discover personal information about a user who visits the website based on the user's add-ons, plug-ins, extensions, and apps installed on the user's browser, and thus use this personal information against the user.

My project: focuses on whether an employer or insurance company could determine that the user has a disability based on the add-ons, plug-ins, extensions, and apps installed on the user's browser, and thus discriminate against the user.

- An example: a person with a vision impairment who uses a screen reader browser enhancer, or a woman wanting to become pregnant who uses an ovulation tracker browser enhancer, applying for a job on the potential employer's website. The potential employer sees the installed browser enhancer
- Key Points:
    - Ease of add-on detection – disability-focused add-ons
    - Current & future availability of access-related add-ons
    - Cost associated with add-on detection versus other modes of detection
    - Employer/insurance company demand for disability information

Current Threat → The Technology: Digital Fingerprint: As people peruse the Internet, they leave behind a digital fingerprint that can reveal their confidential information.

- This digital fingerprint may include a user's personal information, such as a disability or use of an ovulation tracker.
- Many people do not know how easy it is for a website to detect the user's installed browser enhancers.
- When you visit a website, that website asks your computer for your browser's installed browser enhancers, and other information about your computer such as screen size,[1] to ensure that the content it sends to your computer is properly formatted.
    - The website can determine the user's web user agent, which ranges from web browsers to screen readers and Braille browsers for people with disabilities.[2]

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[1] *What Fingerprints Does Your Browser Leave Behind as You Surf the Web?*, PANOPTICLICK, http://panopticlick.eff.org/about.php (last visited Feb. 1, 2010).

[2] This is another way in which an employer or insurance company could learn that a person uses an accessibility program to access online content. However, this approach is beyond the scope of my project.

- In the HTTP protocol, the User-Agent header field typically transmits a characteristic identification string to the website's server that identifies its application type, operating system, software vender, and software version.
- The website server can also ask the user's device for its screen size and color depth, system fonts, and whether cookies are enabled.
- The user's browser transmits to the website server its HTTP accept headers. The accept header tells the website server what type of content the browser accepts to ensure that the server sends the browser correctly formatted content. Websites also can query the user's browser for a list of installed plug-ins and some browser add-ons, extensions, and apps

ADA / Legal Issues:

- If an employer does this, it violates the ADA.
- Probably not illegal for an insurance company to do this unless it is connected to an employer.
- Tough to prove.

Definitions:

- Browser enhancer: used to collectively refer to browser add-ons, plug-ins, extensions, and apps.
- Add-on: a piece of software that enhances the capabilities of a larger software application, such as a web browser.
  - Add-on is sometimes used generally to refer to add-ons, plug-ins, and extensions.
- Plug-in: a set of software components that adds specific capabilities to a larger software application. Browser plug-ins enable the web browser to play video, scan for viruses, and display new file types.
  - Common plug-ins: Adobe Flash Player, Adobe Acrobat, Google Earth, and Quick Time.
- Browser extension: modify the behavior of existing features or add entirely new features to the browser application.
  - Browser extension is commonly used interchangeably with add-on and plug-in. However, the term really depends on the browser, i.e. Firefox and Chrome use extensions.
  - Examples of extensions include RSS readers, bookmark organizers, toolbars, e-mail, and developer tools. Greasemonkey is a Firefox extension that modifies how the user views web pages; it allows the user to customize the way a webpage displays.
- Apps: similar to add-ons, but with some differences.
  - Used in Google's Chrome browser.

Solution:

- Legislation?

- Technical solution would be difficult because users want the websites to know about accessibility programs installed to ensure that the content is properly formatted.

Browser Plugin Details	20.41+	1393556	(Embedded Java Applet; application/x-java-applet;version=1.1.3; xja113) (Embedded Java Applet; application/x-java-applet;version=1.2; xja12) (Embedded Java Applet; application/x-java-applet;version=1.2.1; xja121) (Embedded Java Applet; application/x-java-applet;version=1.1; xja11) (Embedded Java Applet; application/x-java-applet;version=1.4.2; xja142) (Embedded Java Applet; application/x-java-applet;version=1.1.1; xja111) (Embedded Java Applet; application/x-java-applet;version=1.3.1; xja131) (Embedded Java Applet; application/x-java-applet;version=1.6; xja16) (Embedded Java Applet; application/x-java-applet; xja) (Embedded JVM; application/x-java-vm; xjv) (Embedded Java Applet; application/x-java-applet;version=1.4; xja14) (Embedded Java Applet; application/x-java-applet;version=1.1.2; xja112) (Embedded Java Applet; application/x-java-applet;version=1.2.2; xja122). Plugin 4: Java Plug-In 2 for NPAPI Browsers; Java Plug-In 2 for NPAPI Browsers; JavaPlugin2_NPAPI.plugin; (Java applet; application/x-java-applet;version=1.3;) (Java applet; application/x-java-applet;version=1.5;) (Java applet; application/x-java-applet;version=1.1.3;) (Java applet; application/x-java-applet;version=1.2;) (Java applet; application/x-java-applet;version=1.2.1;) (Java applet; application/x-java-applet;version=1.4.2;) (Java applet; application/x-java-applet;version=1.1;) (Java applet; application/x-java-applet;version=1.1.1;) (Java applet; application/x-java-applet;version=1.3.1;) (Java applet; application/x-java-applet;jpi-version=1.6.0_22;) (Java applet; application/x-java-applet;version=1.6;) (Basic Java Applets; application/x-java-applet; javaapplet) (Java applet; application/x-java-vm;) (Java applet; application/x-java-applet;version=1.4;) (Java applet; application/x-java-applet;version=1.1.2;) (Java applet; application/x-java-applet;version=1.2.2;). Plugin 5: Microsoft Office Live Plug-in; Office Live Update v1.0; OfficeLiveBrowserPlugin.plugin; (Office Live Update v1.0; application/officelive;). Plugin 6: Picasa; Picasa plugin.; Picasa.plugin; (3.1; application/x-picasa-detect; picasa). Plugin 7: QuickTime Plug-in 7.6.9; The QuickTime Plugin allows you to view a wide variety of multimedia content in web pages. For more information, visit the <A HREF=http://www.apple.com/quicktime>QuickTime</A> Web site.; QuickTime Plugin.plugin; (SDP stream descriptor; application/sdp; sdp) (SDP stream descriptor; application/x-sdp; sdp) (RTSP stream descriptor; application/x-rtsp; rtsp,rts) (QuickTime Movie; video/quicktime; mov,qt,mqv) (Video For Windows; video/x-msvideo; avi,vfw) (Video For Windows; video/msvideo; avi,vfw) (Video For Windows; video/avi; avi,vfw) (AutoDesk Animator; video/flc; flc,fli,cel) (WAVE audio; audio/x-wav; wav,bwf) (WAVE audio; audio/wav; wav,bwf) (AIFF audio; audio/aiff; aiff,aif,aifc,cdda) (AIFF audio; audio/x-aiff; aiff,aif,aifc,cdda) (uLaw/AU audio; audio/basic; au,snd,ulw) (MIDI; audio/mid; mid,midi,smf,kar) (MIDI; audio/x-midi; mid,midi,smf,kar) (MIDI; audio/midi; mid,midi,smf,kar) (QUALCOMM PureVoice audio; audio/vnd.qcelp; qcp) (GSM audio; audio/x-gsm; gsm) (AMR audio; audio/AMR; AMR) (AAC audio; audio/aac; aac,adts) (AAC audio; audio/x-aac; aac,adts) (CAF audio; audio/x-caf; caf) (AC3 audio; audio/ac3; ac3) (AC3 audio; audio/x-ac3; ac3) (QUALCOMM PureVoice audio; audio/vnd.qcelp; qcp) (MPEG media; video/x-mpeg; mpeg,mpg,m1s,m1v,m1a,m75,m15,mp2,mpm,mpv,mpa) (MPEG media; video/mpeg; mpeg,mpg,m1s,m1v,m1a,m75,m15,mp2,mpm,mpv,mpa) (MPEG audio; audio/mpeg; mpeg,mpg,m1s,m1a,mp2,mpm,mpa,m2a) (MPEG audio; audio/x-mpeg; mpeg,mpg,m1s,m1a,mp2,mpm,mpa,m2a) (3GPP media; video/3gpp; 3gp,3gpp) (3GPP media; audio/3gpp; 3gp,3gpp) (3GPP2 media; video/3gpp2; 3g2,3gp2) (3GPP2 media; audio/3gpp2; 3g2,3gp2) (SD video; video/sd-video; sdv) (AMC media; application/x-mpeg; amc) (MPEG-4 media; video/mp4; mp4) (MPEG-4 media; audio/mp4; mp4) (AAC audio; audio/x-m4a; m4a) (AAC audio; audio/x-m4p; m4p) (AAC audio book; audio/x-m4b; m4b) (Video; video/x-m4v; m4v) (MP3 audio; audio/mpeg; mp3,swa) (MP3 audio; audio/x-mpeg; mp3,swa) (MP3 audio; audio/mp3; mp3,swa) (MP3 audio; audio/x-mp3; mp3,swa) (MP3 audio; audio/mpeg3; mp3,swa) (MP3 audio; audio/x-mpeg3; mp3,swa) (BMP image; image/x-bmp; bmp,dib) (MacPaint image; image/x-macpaint; pntg,pnt,mac) (PICT image; image/pict; pict,pic,pct) (PICT image; image/x-pict; pict,pic,pct) (PNG image; image/png; png) (PNG image; image/x-png; png) (QuickTime image; image/x-quicktime; qtif,qti) (SGI image; image/x-sgi; sgi,rgb) (TGA image; image/x-targa; targa,tga) (TIFF image; image/tiff; tif,tiff) (TIFF image; image/x-tiff; tif,tiff) (JPEG2000 image; image/jp2; jp2) (JPEG2000 image; image/jpeg2000; jp2) (JPEG2000 image; image/jpeg2000-image; jp2) (JPEG2000 image; image/x-jpeg2000-image; jp2). Plugin 8: RealPlayer Plugin.plugin; RealPlayer Plugin; RealPlayer Plugin.plugin; (RealPlayer Metafile; audio/x-pn-realaudio; ram) (RealMedia; audio/x-pn-realaudio-plugin; rm). Plugin 9: SharePoint Browser Plug-in; Microsoft Office for Mac SharePoint Browser Plug-in; SharePointBrowserPlugin.plugin; (Microsoft Office for Mac SharePoint Browser Plug-in; application/x-sharepoint;). Plugin 10: Shockwave Flash; Shockwave Flash 10.1 r102; Flash Player.plugin; (FutureSplash Player; application/futuresplash; spl) (Shockwave Flash; application/x-shockwave-flash; swf). Plugin 11: Unity Player; Unity Web Player lets you experience dazzling interactive 3D right in your browser. For more information, visit <A HREF=\"http://www.unity3d.com

Sample Source Code: This code was written by Dr. Clayton Lewis, Professor of Computer Science at the University of Colorado at Boulder. Dr. Lewis's code was adapted from code found at http://www.java-gaming.org/index.php?topic=96.0.

```
<html>
<head><title>plugin list</title>
</head>
<body>
<script type="text/javascript">
var i
with (document){
write("<b>appCodeName:</b> "+navigator.appCodeName+"<br />")
write("<b>appName:</b> "+navigator.appName+"<br />")
for (i in navigator.plugins)
{
write("<b>plugins:</b> "+navigator.plugins[i].name+"<br />")
}
write("<b>appVersion:</b> "+navigator.appVersion+"<br />")
```

```
write("<b>userAgent:</b> "+navigator.userAgent+"<br />")
write("<b>platform:</b> "+navigator.platform+"<br />")
}
</script>
</body>
</html>
```

Outcome from sample source code:
appCodeName: Mozilla
appName: Netscape
plugins: Shockwave Flash
plugins: Shockwave Flash
plugins: QuickTime Plug-in 7.6.9
plugins: Chrome PDF Viewer
plugins: Picasa
plugins: WebEx General Plugin Container
plugins: Google Earth Plug-in
plugins: Google Talk NPAPI Plugin
plugins: iPhotoPhotocast
plugins: Java Plug-In 2 for NPAPI Browsers
plugins: Google Talk Plugin Video Accelerator
plugins: Microsoft Office Live Plug-in
plugins: RealPlayer Plugin.plugin
plugins: SharePoint Browser Plug-in
plugins: Unity Player
plugins: Verified Download Plugin
plugins: Default Plug-in
plugins: undefined
plugins: item
plugins: namedItem
plugins: refresh
appVersion: 5.0 (Macintosh; U; Intel Mac OS X 10_5_8; en-US) AppleWebKit/534.16 (KHTML, like Gecko) Chrome/10.0.648.134 Safari/534.16
userAgent: Mozilla/5.0 (Macintosh; U; Intel Mac OS X 10_5_8; en-US) AppleWebKit/534.16 (KHTML, like Gecko) Chrome/10.0.648.134 Safari/534.16
platform: MacIntel